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ABSTRACT

The purpose of this study was to investigate the interaction of male and female students with teachers in low-achieving (LAC) and high-achieving (HAC) middle school biology classes. Forty-six students from HAC and 44 students from LAC were observed during a semester for their interaction with their teacher. Findings indicate that males received more teacher-initiated questions, teacher-directed interactions and teacher feedback than females in both HAC and LAC, but the degree of gender differences in those interaction patterns varied from high to low-achieving classes. Males in HAC and LAC received more instances of every kind of teacher feedback than females, but females in LAC received more instances of praise and further questions from the teacher. In HAC males were found to initiate more questions than females while in LAC the females initiated more questions. (Author/JRH)

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Gender Difference in Teacher-Student Interaction In High- and Low-Achieving Middle School Biology Classes

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ABSTRACT

The Purpose of this study was to investigate different gender students interaction with teacher in high and low-achieving middle school biology classes. A total of 46 and 44 students from high and low-achieving classes, respectively, were observed for their interaction with teacher for a semester. Results showed that males received more teacher-initated questions, teacher-directed interactions,a nd teacher feedback than females in both HAC and LAC; but the degree of gender differences in those interaction pattern are varied from high to low-achieving classes. On the other hand, males in HAC and LAC received more instances of every kinds of teacher feedback than females, but females in LAC received more instances of praise and further question from teacher. In addition, different gender students-initiated interaction with teachers also differed in HAC and LAC. Males in HAC initiated more questions than females, while females in LAC initated more questions than males did.

I. Significance

Most of the relevant research studies in the area of gender-related difference in classroom interactions have explored the notion of equality of treatment of girls and boys. Numerous studies have shown that male and female students receive different treatment from their teacher. Bean (1976), Parsons (1979) and Cooper and Good (1983) reported that teachers interact more with male than female students in science class. Boys initiate more contacts with teachers than do girls (Fennema et al., 1980) and teachers initiate more contacts with boys (Brophy & Good, 1974; Fennema et al., 1980). In Good, Sikes,a nd Brophy's study (1973), boys interacted more frequently and aggressively with teachers than girls; teachers were more likely to ask boys process questions and to ask girls product and choice questions. Brophy , Evertson, Anderson, Baum and Crawford's (1981) findings indicated that boys called out more to teacher-initiated questions.

The Deboer (1984) and Fox (1976) studies reported that the junior high years are the most critical period in the determination of gender role interests and differences in achievement between boys and girls in science and mathematics. Fox (1976) suggested that social factor appears feasible for explaining the lag of adolescent girls' interests in science. He further pointed out that the classroom itself serves as one area in which social roles in science are learned through interactions with teachers and peers. In addition, researches indicated that teacher appears to be one of the persons might reinforce the gender-differences through the differential feedback they give to boys and girls (Dweck & Bush, 1976; Dweck, Davidson, Nelson, & Enna, 1978).

Though such a great number of researches demonstrated that boys interact more with teachers, but would this gender-related teacher-students

interaction pattern also exist from one class to another? This study is particularly interested on the high and low-achieving classes male and female students interaction with teacher. It has been found that high-achieving class students perform better in academic tasks than low-achieving class, the question is whether they participate or interact with teacher differently? What kinds of different gender-related teacher-students interaction would be? Will such differences also happen in similar pattern in HAC and LAC?

According to the review of literature, it showed that most of the gender-related class interaction studies were conducted at mathematics class, few of them were conducted at science classes, and rarely specifically focused on junior high school biology class interaction. Therefore, we decide to focus on biology classes as our studying context to investigate gender differences in teacher-students interaction in high and low-achieving classes.

II. Procedure

As Good and Brophy's study (1991) mentioned looking for specific behaviors in the classroom as one way to minimize the degree to which our attitudes and biases will color what we see. With classroom observation, we would actually know what extent of interaction is taking place between teacher and students. Therefore, the Modified Brophy-Good Dyadic Interaction schedule
(Good & Brophy, 1991) was used to measure the extent and nature of students-teacher interaction in biology classes.

A total of 46 students (23 male, 23 female) in high achieving class (HAC) , and 44 students (23 male, 21 female) in low achieving class (LAC) were to be observed their interaction with their biology teacher during seventh grade.

Classroom observation were conducted twice a week for a semester. More than 30 classes periods were observed, and the length of each class was 50 minutes.

III. Findings

Teacher-Initiated Interaction with Students in both HAC and LAC

Differences in the type of teacher-initiated question for males and females were observed in HAC and LAC. In high achieving class (HAC), of 584 teacher-initiated questions , 459 were answered by boys, and 125 were answered by girls (78% vs. 22%). In low achieving class (LAC), of 504 teacher-initiated questions, 286 were answered by boys, and 218 were answered by girls (57% vs. 43%). It obviously revealed that girls in LAC answered many more questions than did girl in HAC. For types of questions, males in HAC answered 33 procedure questions, 61 process questions, 305 product questions, and 60 choice questions; female in HAC answered 12 procedure questions, 12 process questions, 92 product questions, and 9 choice questions. In short, male students in HAC dominated every types of questions than female students.

Males in LAC answered 12 proceudre questions, 20 process questions, 203 product questions and 51 choice questions; female in LAC answered 22 procedure questions, 21 process questions, 134 product questions and 51 choice questions. In general, boys in LAC answered more product and choice questions, while females in LAC answered more procedure and process question than males did. The greatest number of questions answered by both sex students in both HAC and LAC were product questions. In compariing the

amount and types of teacher-initiated questions answered by HAC and LAC boys and girls, it again demonstrated that females in LAC played more equal role with their male peers than did HAC.

Male and female students also differed in the amount of reaction pattern. Boys and girls in HAC answered 341 and 66 (59.5% vs. 11.5%) , and boys and girls in LAC answered 169 and 154 (33.5% vs. 30.5%) teacher-initiated questions by call out, respectively. It indicated that grils in LAC call out about the same amount questions as boys did, which is significantly different from HAC girls in comparing with their male peers ($\chi 2=84.66$, $p < 0.000$). Teacher directed boys to answer more question than girls n both HAC and LAC (HAC boys: HAC girls = 84:25; LAC boys: LAC girls = 106 : 58). Moreover, teacher directed students in LAC to answer more questions than HAC.

Regarding the correctness of questions male and female students answered, it showed that males in HAC answered 317 out of 449 questions correctly (70.6%) , and females in HAC answered 79 out of 120 questions correctly (65.8%). Males in LAC answered 178 out of 283 questions correctly (62.9%), and females in LAC answered 156 out of 217 questions correctly (71.9%). Interestingly, male students answered slightly higher percentage of questions incorrectly than female students regardless of HAC and LAC. Males and females in HAC answered 17.4% and 15.8% questions incorrectly, respectively. Males and females in LAC answered 18.7% and 16.1% questions incorrectly, respectively.

Teacher also differed in the amount of feedback given to males and females in HAC and LAC (Table 1, 2). There are 757 and 667 instances of teachers' feedback to HAC and LAC students. The teacher directed 78% of 757 instances of feedback to boys and 22% to girls in HAC. The teacher directed 56% of 667 instances of feedback to boys and 44% to girls in LAC. For

HAC, teaher gave boys more praise(boys: girls = 2.8% : 1.7%) and affirm (3.8% : 1.9%) than did girls. Boys also recieved two time as many negate as girls did (boys: grils= 1.5% : 0.7%). Teachers gave boys further questions about four times higher than for girls (13.7%: 3.2%), and questioning male students answers about six times higher than for girls (7.8%: 1.2%). In general, males in HAC received more instances of every kind of feedback from teacher than females. As was true for the LAC males, except females received more instances of praise (boys: girls = 2.8%: 3.6%) and further question (6.4%: 8.0%). Regardless gender and level of achievement classes, most feedback received from teacher were restating answer, further question, and clarification. For differences in types of feedback received from teacher in the HAC and LAC, students in LAC had greater percentages of praise, correction, comments, repeat question, and no feedback in comparison with students in HAC.

According to the teacher feedback versus the correctness of questions male and female students answered, it showed that praise and affirm only was given by teacher while students answered correctly regardless of gender and level of achievement. The negate only was given by teacher while students answered incorrectly. Regardless of gender and level of achievement classes, while students answered correctly, most feedback received from teacher were restating answer, further questioning, and clarification.

Students-Initiated Interaction with Teacher in Both HAC and LAC

Of 39 student-initiated questions in high achieving class (HAC), 30 were initiated by boys, and 9 were initiated by girls. Of 28 teacher-initiated questions in low achieving class (LAC), 9 were initiated by boys, and 19 were initiated by girls. Most of the questions initiated by both sex students in both high and low-

achieving classes were product questions. Regardless of gender or level of achievement classes, all of the students-initiated questions were answered by call out, and most feedback received from teacher were explain, and give answer.

IV. Conclusions

Results indicated that male students answered about four times as many teacher-initiated questions as girls did in HAC, while in LAC, males answered slightly more questions than females which supports Bean (1976), Parsons (1979) and Cooper & Good (1983) findings, teacher interact more with male than female in science class in general. In details, according to the number and types of teahcer-initiated questions results, we will be able to conclude that girls in LAC are playing more equal role with boys, especially girls answered more process questios than boys did. The possible explanation that in low-achieving classes, both boys and girls perceive they are the same, resulting in a a lack of significant differences of teacher-initiated questions which still needs further investigation.

Male students call out more often than females students in HAC which supports Brophy, Everton, Anderson, Baum, and Crawford (1981) results. However, we also found that females in LAC call out questions about as many as boys did (boys: girls =169:154). It again indicated that girls participated class interaction more equally with their opposite sex peer in LAC. Teacher directs male students to answer questions more often than female students in both HAC and LAC. This again supports teachers initiate more contacts with boys (Good & Brophy, 1974; Fennema et al., 1980). It supports that techers'

perception of boys are more active and catch up quickly than girls did, so teacher more likely to direct boys to answered more question than girls did .

The students-initiated interaction with teacher results revealed that males in HAC initiated more questions than females. In contrast, LAC females initiated more questions than males did. The possible explanation may be that in low achieving class, both males and females perceive that no one was good, resulting in a lack of significant differentiation between their interaction with teacher (Webb & Kenderski, 1985), which still needs further investigation.

Throughout this study, we found that males are more active than females in most types of teacher-initiated interaction in both HAC and LAC. When we examined the details, we found that the equality of different gender students in teacher-students interaction are varied from HAC to LAC. In HAC males are more dominate than females, while in LAC males are more likely to play equal role with females. Especially, for students-initiated interaction part, we found that LAC females students initiated more questions than males did. These results suggest that gender-related teacher-students interaction pattern seems existed in HAC and LAC in some extent, but it is varied somewhat depending on the particular type of interaction.

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